

REMARKS

Applicants have cancelled claims 1 and 7 and amended claims 2, 3, 8 and 9. The amendments to claims 2 and 8 rewrite the claims to appear in independent form and improve English usage. The amendments to claims 3 and 9 change their dependencies.

Applicants confirm the election of the claims of Group II, claims 1-3 and 7-9, *without traverse*.

The disclosure of the specification has been objected to because of the expression “half value width” in paragraphs 4 and 5. This expression is well known in the art as a term to define a width of a distribution of naturally occurring phenomena. A half value width is the width of a peak at its half maximum value. For example, a half value width of a Gaussian distribution, $\exp(-x^2/2\sigma^2)$, is the width of the Gaussian peak at one half of the peak value, $2\sqrt{(2\ln 2)}\sigma$. Although the Examiner seems to object to this expression because it does not describe any definite length, half value width is the conventionally used form to define such a width of a distribution and cannot be converted into a definite length unless a particular distribution is given. In the etching rate distribution peak shown in FIG. 2, the half value width “d” is given as the width of the peak at one half of the maximum etching rate. To help the Examiner’s understanding of this terminology, applicants attach to this amendment three technical papers in which the expression “half value width” is used and have highlighted these expressions as used in the papers.

Claims 1-3 and 7-9 have been rejected under 35 USC 112, second paragraph, as indefinite. Applicants respectfully traverse this rejection.

The Examiner contends that the statement in the claims that the radius of the wafer table is larger than the radius of the semiconductor wafer is indefinite because semiconductor wafers

may have different sizes and this makes the comparison to the wafer table indefinite. To support his argument, the Examiner points to MPEP 2173.05(b). Applicants do not understand why the Examiner reached his conclusion based on the cited portion of the MPEP. MPEP 2173.05(b) states, "Acceptability of the claim language depends on whether one of ordinary skill in the art would understand what is claimed, in light of the specification." Although the size of semiconductor wafers may vary, e.g., 4, 6, 8 and 12 inches, persons skilled in the art know that it would be easy to create a wafer table that is larger than one of such wafers and to tune the size difference between the wafer and the wafer table as recited in claims. The claims cover the etching apparatus and wafer tables that work with a semiconductor wafer of any size as long as the limitations recited in the claims are met.

The Examiner also objects to claims 2 and 8 because they recite "half value width," which the Examiner finds as providing no definite length. As explained above, once a distribution is given, persons skilled in the art can easily determine the half value width from the distribution. That is, based on the statement in the claims that the difference between the radius of the semiconductor wafer and the radius of the wafer table is 10 to 40 percent of the half value width of the etching rate distribution peak of the gas injected from the nozzle, persons skilled in the art first measure the etching rate distribution peak of a gas flow used for etching relying on the description of the specification, take the half value width from the etching rate distribution peak, and provide a wafer table having a size such that the size difference between the wafer table and a wafer chosen for his etching process is 10 to 40 percent of the half value width. Persons skilled in the art can readily determine the scope of the claimed device based on the language of the claims and the specification. Thus, the rejection of claims 1-3 and 7-9 under 35 USC 112, second paragraph, should be withdrawn.

Claims 1 and 7 have been rejected under 35 USC 102(b) as anticipated by U.S. Patent No. 5,980,769 (Yanagisawa). This rejection is moot in view of the cancellation of claims 1 and 7.

Claims 2, 3, 8 and 9 have been rejected under 35 USC 103(a) as unpatentable over Yanagisawa in view of U.S. Patent No. 6,136,213 (Shinozuka). This rejection is respectfully traversed.

The Examiner states that the typical size of Yanagisawa's gas nozzle is between 7 and 30 mm and that Shinozuka's gas nozzle has the maximum etching rate at its center. Based on this finding, the Examiner concludes that claims 2 and 8 are obvious. However, neither Yanagisawa nor Shinozuka teaches or suggests that the difference between the radius of the semiconductor wafer and the radius of the wafer table is 10 to 40 percent of the half value width of the etching rate distribution peak of the gas injected from the nozzle. Applicants request that the Examiner provide reasons supported by evidence why persons of ordinary skill in the art would have arrived at the claimed invention based on the Examiner's findings from Yanagisawa and Shinozuka. Without such an argument and supporting evidence, this rejection fails.

Applicants also point out to the Examiner that the claimed alignment of the wafer and the wafer table is designed to reduce uneven etching occurring at the edge of the semiconductor wafer. Applicants found that the asymmetrical gas flow at the edge of the wafer causes the uneven etching and thus regulated the gas flow by adjusting the alignment of the wafer and the wafer table with respect to the source of the gas flow, i.e., the half value width of the etching rate distribution peak. See, for example, paragraphs [0030] and [0031] of the specification. Neither Yanagisawa nor Shinozuka describes such a problem. Without the knowledge of the asymmetrical gas flow, persons of ordinary skill in the art would not have been motivated to control the gas flow by adjusting the alignment of the wafer and the wafer table with respect to

the size of the gas flow source. Solving a problem whose very existence the prior art does not acknowledge cannot have been obvious. *In re Nomiya*, 184 USPQ 507 (CCPA 1975).

The rejection of claims 2, 3, 8 and 9 over Yanagisawa and Shinozuka should be withdrawn.

In light of the above, a Notice of Allowance is solicited.

In the event that the transmittal letter is separated from this document and the Patent and Trademark Office determines that an extension and/or other relief is required, applicant petitions for any required relief including extensions of time and authorizes the Commissioner to charge the cost of such petitions and/or other fees due in connection with the filing of this document to **Deposit Account No. 03-1952**, referencing Docket No. 506212000600.

Respectfully submitted,

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